

WHAT IS CLAIMED IS:

1           1.     A light curtain generating device, comprising a light emitting  
2     pillar assembly accommodating an array of light emitting units within a  
3     pillar case and a light receiving pillar assembly accommodating an array of  
4     light receiving units within a pillar case, the light emitting pillar assembly  
5     and light receiving pillar assembly being placed opposite to each other so  
6     as to form a light curtain for detecting an object between the pillar  
7     assemblies, characterized in that:

8                     the light emitting unit array and light receiving unit array  
9     accommodated in the respective pillar cases each comprise a group of  
10    single-beam optical modules.

11           2.     A light curtain generating device according to claim 1,  
12    wherein each opposing pair of a light emitting unit and a light receiving  
13    unit perform a detecting action in a prescribed order.

14           3.     A light curtain generating device according to claim 1,  
15    wherein each single-beam optical module consists of a light emitting unit  
16    or a light receiving unit comprising a lens, an optical element and a holder  
17    integrally incorporated with them so as to align them with a prescribed  
18    optical axial line.

19           4.     A light curtain generating device according to claim 3,  
20    wherein the holder is made of plastic material.

21           5.     A light curtain generating device according to claim 4,  
22    wherein the lens and optical element are jointed to the plastic holder by  
23    snap fit arrangements.

24 6. A light curtain generating device according to claim 1,  
25 wherein each group of single-beam optical modules comprises an optical  
26 module block including a plurality of single-beam optical modules arranged  
27 in a single row by being attached to a metallic plate having a prescribed  
28 length.

29 7. A light curtain generating device according to claim 6,  
30 wherein each single-beam optical module forming the optical module  
31 block is attached to the metallic plate at a side of the single-beam optical  
32 module extending in parallel with the optical axial line.

33 8. A light curtain generating device according to claim 7,  
34 wherein each single-beam optical module forming the optical module  
35 block is attached to the metallic plate by a snap fit arrangement.

36 9. A light curtain generating device according to claim 3,  
37 further comprising a circuit board having a plurality of optical element  
38 mountable positions, and signal processing means for electrically and  
39 selectively disabling the optical element mountable positions.

40 10. A light curtain generating device according to claim 1,  
41 wherein each pillar assembly comprises a base frame defining mounting  
42 positions for single-beam optical modules, and a plurality of single-beam  
43 optical modules mounted in the mounting positions of the base frame.

44 11. A light curtain generating device according to claim 10,  
45 wherein the base frame consists of a metallic plate member.

46 12. A light curtain generating device according to claim 10,  
47 wherein at least one of the mounting positions is devoid of a single-beam  
48 optical module.

49 13. A light curtain generating device according to claim 1,  
50 wherein each pillar assembly comprises at least two base frames arranged  
51 in series along a length of the pillar assembly each defining mounting  
52 positions for single-beam optical modules, and a plurality of single-beam  
53 optical modules mounted in the mounting positions of the base frames.

54 14. A light curtain generating device according to claim 13,  
55 wherein the mounting positions of the two base frames have different  
56 pitches.

57 15. A light curtain generating device according to claim 14,  
58 wherein the two base frames have different numbers of mounting  
59 positions.

60 16. A light curtain generating device according to claim 14,  
61 wherein the two base frames have different lengths.

62 17. A light curtain generating device according to claim 14,  
63 wherein the base frames consist of metallic plate members.